

**CLAIMS**

What is claimed is:

1. A brake gain-based torque controller, comprising:
  - an input for receiving a command torque indicative of a desired amount of brake torque applied to a wheel of a vehicle;
  - an input for receiving a signal indicative of a measured amount of brake torque applied to the wheel , and
  - an output for providing a brake pressure output command to a brake actuator and a brake assembly which applies a brake pressure to the wheel based on the brake pressure output command,
  - wherein the brake gain-based torque controller adjusts the brake pressure output command provided to the brake actuator and the brake assembly using a computed inverse brake gain based on the signal indicative of a measured amount of brake torque applied to the wheel and a pressure signal indicative of an amount of the brake pressure applied by the brake assembly.
2. The brake gain-based torque controller of claim 1, wherein the brake gain-based torque controller is configured to limit the brake pressure output command based on the measured amount of brake torque applied to the wheel.
3. The brake gain-based torque controller of claim 1, further including:
  - an output for providing the computed inverse brake gain to scale the brake pressure output command, wherein the computed inverse brake gain is a function of the brake torque applied to the wheel resulting from an amount of pressure applied to the wheel by the brake actuator via the brake assembly.
4. The brake gain-based torque controller of claim 1, wherein the pressure signal is contained in a look-up table.
5. The brake gain-based torque controller of claim 1, wherein the brake pressure output command is operative to control a pressure valve included in the brake actuator and the brake assembly.

6. The brake gain-based torque controller of claim 1, wherein the brake pressure output command is operative to control a flow valve included in the brake actuator and the brake assembly.
7. The system of claim 1, wherein the vehicle is an aircraft.
8. The system of claim 1, wherein the vehicle is an automobile.
9. The brake gain-based torque controller of claim 1, further including:  
an input for receiving the pressure signal which is indicative of an amount of pressure applied to the wheel by the brake assembly from a pressure sensor operatively coupled to the brake actuator and the brake assembly for measuring the amount of pressure applied to the wheel.
10. The brake gain-based torque controller of claim 9, wherein the pressure sensor is configured for measuring an amount of pressure of a fluid controlled by a flow valve, the amount of pressure being indicative of an amount of brake force applied to the wheel.
11. The brake gain-based torque controller of claim 1, wherein the signal indicative of the amount of brake torque applied to the wheel is a measured torque signal  $T_m$ .
12. The brake gain-based torque controller of claim 11, wherein the measured torque signal  $T_m$  is fed into the brake gain-based torque controller to determined the computed inverse brake gain based on the desired response characteristics of the brake gain-based torque controller.
13. The brake gain-based torque controller of claim 1, further including:  
a gain block which receives as an input the pressure signal and outputs a signal that is scaled to the signal indicative of the amount of brake torque applied to the wheel.
14. The brake gain-based torque controller of claim 13, wherein the measured torque signal  $T_m$  is used as an upper limit of a limiter of the brake gain-based torque controller in order to prevent damage to a tire.

15. The brake gain-based torque controller of claim 1, wherein the brake gain-based torque controller limits the brake pressure output command based on the measured torque as a function of the measured torque.

16. The brake gain-based torque controller of claim 15, further including:  
circuitry which limits the brake pressure output command based on the measured torque as a function of the measured torque.

17. A brake control system, comprising:  
an operator command device;  
a brake gain-based torque controller coupled to receive as a first input, a command torque output of the operator command device;  
a brake actuator coupled to receive a brake pressure output command from the brake gain-based torque controller;  
a brake assembly coupled to a wheel to apply a pressure to the wheel based on an output of the brake actuator coupled thereto; and  
a torque sensor coupled to the wheel to provide a torque signal to the brake gain-based torque controller indicative of the torque applied by the wheel to a vehicle, to which the wheel is coupled;  
wherein the torque signal is fed into the brake gain-based torque controller to determine a computed inverse brake gain to calculate the brake pressure output command of the brake gain-based torque controller in order to control the pressure to the wheel to achieve the command torque output.

18. The brake gain-based torque controller of claim 17, wherein the brake gain-based torque controller is configured to limit the brake pressure output command based on the measured amount of brake torque applied to the wheel.

19. The brake gain-based torque controller of claim 17, further including:  
an input for receiving a signal indicative of an amount of pressure applied to the wheel by the brake assembly from a pressure sensor operatively coupled to the brake actuator and the brake assembly for measuring the amount of pressure applied to the wheel.

20. A method for controlling a braking torque applied to a wheel of a vehicle, comprising the steps of:

receiving a brake torque command indicative of a desired amount of brake torque to be applied to the wheel, and providing a brake pressure output command to a brake actuator and a brake assembly which applies a brake torque to the wheel based on the brake pressure output command;

measuring an amount of brake torque applied to the wheel and using a signal indicative of the amount of applied brake torque to perform torque feedback control of the brake pressure output command; and

adjusting the brake pressure output command provided to the brake actuator using the torque feedback control based on the measured amount of brake torque, the adjusting step including a step of limiting a degree of the torque feedback control based on the amount of brake torque applied to the wheel.